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Lake Houston, Harris County, Texas

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Prepared for

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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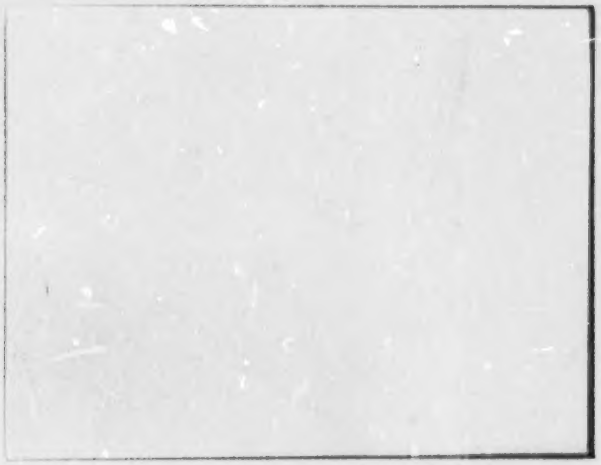

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REPORT

ON

LAKE HOUSTON

HARRIS COUNTY

TEXAS

EPA REGION VI

WORKING PAPER No. 647

WITH THE COOPERATION OF THE

TEXAS WATER QUALITY BOARD

AND THE

TEXAS NATIONAL GUARD

MARCH, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Texas Water Quality Board for professional involvement, to the Texas National Guard for conducting the tributary sampling phase of the Survey, and to those Texas wastewater treatment plant operators who voluntarily provided effluent samples.

Hugh C. Yantis, Jr., Executive Director of the Texas Water Quality Board, and John B. Latchford, Jr., Director, and the staff of the Field Operations Division provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

Major General Thomas Bishop, the Adjutant General of Texas, and Project Officer Colonel William L. Seals, who directed the volunteer efforts of the Texas National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

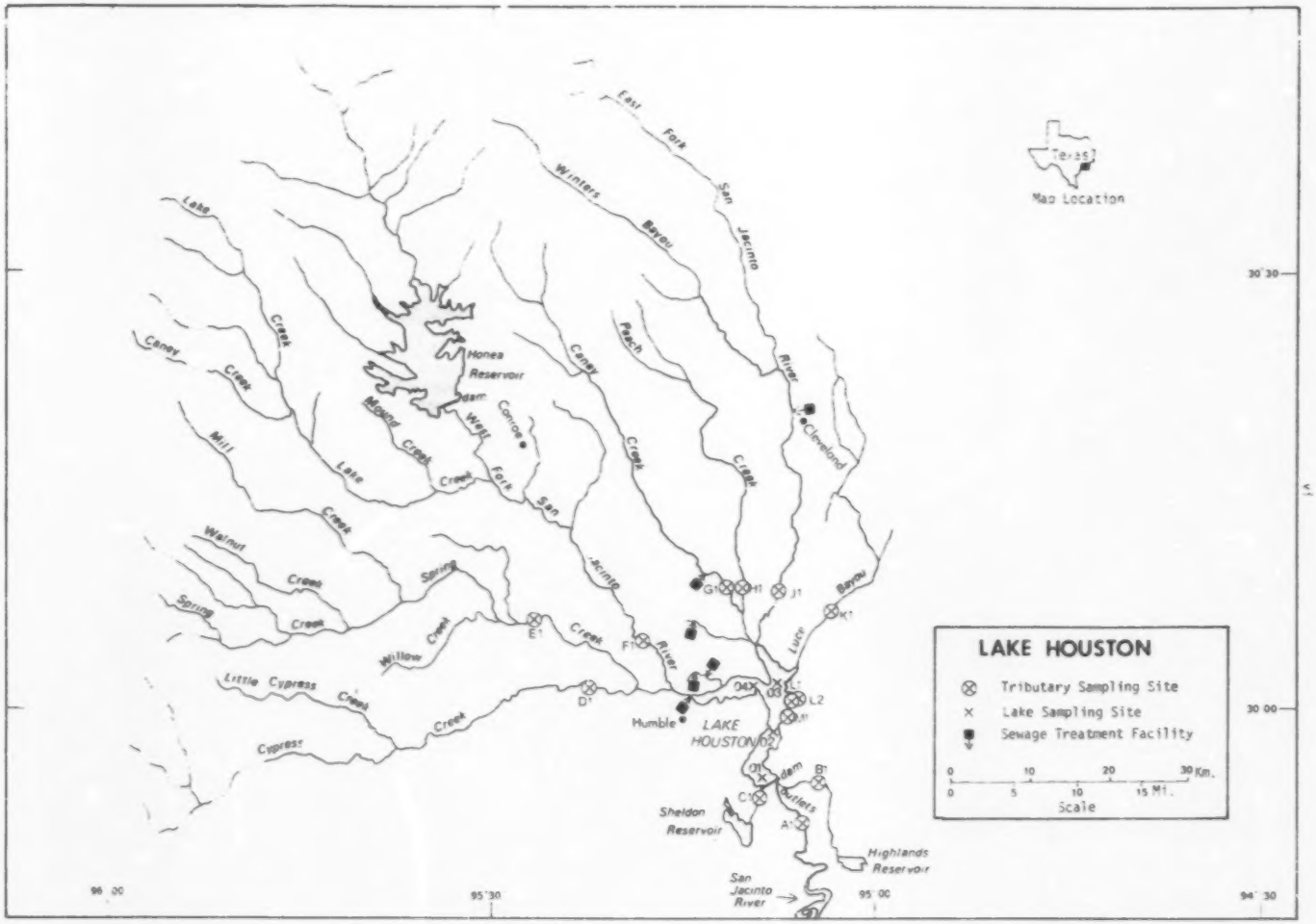
NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

State of Texas

NAME	COUNTY
Amistad	Val Verde
Bastrop	Bastrop
Belton	Bell, Coryell
Braunig	Bexar
Brownwood	Brown
Buchanan	Burnet, Llano
Caddo	Harrison, Marion, TX; Caddo Parish, LA
Calaveras	Bexar
Canyon	Comal
Colorado City	Mitchell
Corpus Christi	Jim Wells, Live Oak, San Patricio
Diversion	Archer, Baylor
Eagle Mountain	Tarrant, Wise
Fort Phantom Hill	Jones
Houston	Harris
Kemp	Baylor
Lake O'The Pines	Camp, Marion, Morris, Upshur
Lavon	Collin
Lewisville (Garza-Little Elm)	Denton
Livingston	Polk, San Jacinto, Trinity, Walker

Lyndon B. Johnson	Burnet, Llano
Medina	Bandera, Medina
Meredith	Hutchinson, Moore, Potter
O. C. Fisher (San Angelo)	Tom Green
Palestine	Anderson, Cherokee, Henderson, Smith
Possum Kingdom	Palo Pinto, Stephens, Young
Sam Rayburn	Angelina, Jasper Nacogdoches, Sabine, San Augustine
Somerville	Burleson, Lee, Washington
E. V. Spence	Coke
Stamford	Haskell
Stillhouse Hollow	Bell
Tawakoni	Hunt, Rains, Van Zandt
Texoma	Cooke, Grayson TX; Bryan, Johnston, Love, Marshall, OK
Travis	Burnet, Travis
Trinidad	Henderson
Twin Buttes	Tom Green
White River	Crosby
Whitney	Bosque, Hill
Wright Patman (Texarkana)	Bowie, Cass


LAKE HOUSTON
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 10 20 30 Km.
0 5 10 15 Mi.
Scale
Texas
Map Location
East Fork San Jacinto River
Winters Bayou
Lake Creek
Caney Creek
Mill Creek
Walnut Creek
Spring Creek
Little Cypress Creek
Cypress Creek
Peach Creek
Lake Creek
Major Creek
West Fork San Jacinto River
Willow Creek
Lucy Bayou
Hones Reservoir
dam
Conroe
Cleveland
Humble
LAKE HOUSTON
Sheldon Reservoir
Buffalo Bayou
Highlands Reservoir
San Jacinto River
30°30
30°00
96°00
95°30
95°00
94°30

LAKE HOUSTON

STORET NO. 4817

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate Lake Houston is eutrophic; i.e., well-supplied with nutrients and quite productive. Whether nutrient enrichment is beneficial or deleterious depends on the actual or potential effect on the uses of the lake. In this regard, the Texas Water Quality Board has indicated that there is little or no impairment of the designated beneficial uses of this water body.

Lake Houston ranked 38th in overall trophic quality when the 39 Texas reservoirs sampled in 1974 were compared using a combination of six water quality parameters*. Thirty-two of the water bodies had less median total phosphorus and median inorganic nitrogen, 34 had less median orthophosphorus, 29 had less mean chlorophyll a, and all of the other water bodies had greater mean Secchi disc transparency.

Survey limnologists observed floating and emergent macrophytes near sampling stations 2, 3, and 4 in May, August, and November.

B. Rate-Limiting Nutrient:

The algal assay results indicate the lake was nitrogen limited at the time the sample was taken (11/06/74). The lake data indicate three of the four sampling stations were nitrogen limited in

* See Appendix A.

March, three were phosphorus limited in May, and all four were nitrogen limited in November. However, the lack of transparency (mean Secchi disc depth <0.4 m) indicates primary productivity may be light-limited much of the time.

C. Nutrient Controllability:

1. Point sources--During the sampling year, municipal point sources contributed an estimated 47.3% of the total phosphorus load to Lake Houston. The City of Cleveland contributed 1.8%; the Forest Cove MUD, 1.2%; the City of Humble, 0.6%; and 36 wastewater treatment facilities which discharge in the Cypress Creek drainage contributed an estimated 43.5% of the total load.

The phosphorus loading of 6.13 g/m^2 measured during the sampling year is over six times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 17). Complete removal of phosphorus at the point sources considered in this report would reduce the overall loading to 3.20 $g/m^2/yr$ which is still 3.3 times the eutrophic loading. Since it is likely that the primary productivity of Lake Houston is light-limited much of the time, point-source phosphorus control would not be expected to result in any appreciable change in the overall trophic condition of the lake.

2. Non-point sources--Non-point sources, including precipitation accounted for 52.2% of the total phosphorus inputs to Lake Houston during the sampling year. After point sources were subtracted, Cypress Creek contributed an estimated 2.3%; the West Fork San Jacinto River, 27.8%; Spring Creek, 10.5%; and the remaining five sampled tributaries collectively contributed 10.0%. The ungaged minor tributaries and immediate drainage contributed an estimated 1.3% of the total load.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Lake Morphometry††:

1. Surface area: 49.53 kilometers^2.
2. Mean depth: 3.7 meters.
3. Maximum depth: >6.1 meters.
4. Volume: 180.953 x 10^6 m^3.
5. Mean hydraulic retention time: 55 days (based on outflow).

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
W. Fk. San Jacinto R.**	2,095.0	18.07
Cypress Creek	782.2	4.26
Spring Creek	1,059.3	5.57
Caney Creek	393.7	2.73
Peach Creek	404.0	2.60
E. Fk., San Jacinto R.	971.2	6.82
Luce Bayou	461.0	3.06
Unnamed Stream L-1	53.9	0.36
Minor tributaries & immediate drainage -	1,054.7	1.26
Totals	7,275.0	44.73

2. Outlet -

San Jacinto R.	7,324.5	30.02
Canal B-1	-	0.76
Canal C-1**	-	7.24
Totals	7,324.5***	38.02***

C. Precipitation****:

1. Year of sampling: 125.2 centimeters.
2. Mean annual: 122.4 centimeters.

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† Table of metric conversions--Appendix B.
†† At spillway crest elevation (Latchford, 1974).
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Anonymous, 1976.
*** Includes area of lake; lesser outflow due to evaporation.
**** See Working Paper No. 175.

III. LAKE WATER QUALITY SUMMARY

Lake Houston was sampled four times in 1974 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from one or more depths at four stations on the lake (see map, page vi). During each visit, a single depth-integrated (near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the November visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 3.0 meters at station 1, 4.9 meters at station 2, 4.6 meters at station 3, and 2.1 meters at station 4.

The sampling results are presented in full in Appendix D and are summarized in the following table (the August nutrient samples were not preserved properly and were not analyzed).

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR HOUSTON LAKE
STORET CODE 4817

PARAMETER	1ST SAMPLING (3/16/74) 4 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (5/23/74) 4 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (8/19/74) 4 SITES RANGE	MEAN	MEDIAN
TEMP (C)	19.7 - 20.5	20.2	20.4	26.7 - 28.4	27.4	27.3	28.0 - 31.9	30.2	30.1
DISS OXY (MG/L)	6.6 - 8.0	7.3	7.0	3.8 - 6.8	5.2	5.6	2.6 - 5.8	4.8	5.0
CNDCTVY (MCROMO)	149. - 350.	201.	193.	176. - 241.	214.	214.	223. - 314.	254.	244.
PH (STAND UNITS)	7.1 - 7.8	7.4	7.5	6.5 - 7.8	7.0	6.8	7.2 - 7.7	7.5	7.6
TOT ALK (MG/L)	37. - 68.	46.	44.	19. - 37.	29.	29.	******	**********	
TOT P (MG/L)	0.050 - 0.105	0.064	0.059	0.084 - 0.176	0.118	0.116	******	**********	
ORTHO P (MG/L)	0.012 - 0.045	0.024	0.023	0.020 - 0.047	0.034	0.036	******	**********	
NO2+NO3 (MG/L)	0.050 - 0.200	0.140	0.160	0.260 - 0.460	0.348	0.340	******	**********	
AMMONIA (MG/L)	0.070 - 0.110	0.090	0.090	0.100 - 0.220	0.135	0.130	******	**********	
KJEL N (MG/L)	0.600 - 1.000	0.684	0.600	0.500 - 1.000	0.727	0.700	******	**********	
INORG N (MG/L)	0.120 - 0.290	0.230	0.250	0.390 - 0.600	0.483	0.490	******	**********	
TOTAL N (MG/L)	0.710 - 1.050	0.829	0.790	0.910 - 1.300	1.075	1.040	******	**********	
CHLRPYL A (UG/L)	8.3 - 10.3	9.1	8.7	6.8 - 111.5	47.2	35.3	6.5 - 12.8	8.8	7.9
SECCHI (METERS)	0.5 - 0.5	0.5	0.5	0.3 - 0.3	0.3	0.3	0.2 - 0.3	0.3	0.3

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR HOUSTON LAKE
STORET CODE 4817

4TH SAMPLING (11/ 6/74)

PARAMETER	4 SITES RANGE	MEAN	MEDIAN
TEMP (C)	20.2 - 22.7	21.9	22.0
DISS OXY (MG/L)	5.0 - 7.2	5.9	6.0
CNDCTVY (MCROMO)	154. - 3889.	2026.	2258.
PH (STAND UNITS)	6.2 - 7.1	6.6	6.5
TOT ALK (MG/L)	18. - 56.	26.	24.
TOT P (MG/L)	0.082 - 0.183	0.111	0.097
ORTHO P (MG/L)	0.033 - 0.099	0.047	0.041
NO2+NO3 (MG/L)	0.020 - 0.120	0.061	0.060
AMMONIA (MG/L)	0.050 - 0.100	0.074	0.080
KJEL N (MG/L)	0.700 - 1.300	0.922	0.900
INORG N (MG/L)	0.070 - 0.220	0.136	0.140
TOTAL N (MG/L)	0.760 - 1.420	0.983	0.990
CHLRPYL A (UG/L)	0.5 - 3.5	1.6	1.2
SECCHI (METERS)	0.3 - 0.4	0.4	0.4

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
03/16/74	1. Melosira sp.	2,173
	2. Chroomonas sp.	739
	3. Cyclotella sp.	601
	4. Chroococcus sp.	462
	5. Merismopedia sp.	277
	Other genera	1,574
	Total	5,826
05/23/74	1. Cryptomonas sp.	313
	2. Ankistrodesmus sp.	251
	3. Stephanodiscus sp.	251
	4. Flagellates	188
	5. Actinastrum sp.	125
	Other genera	1,051
	Total	2,179
08/19/74	1. Cryptomonas sp.	596
	2. Chroococcus sp.	547
	3. Oscillatoria sp.	199
	4. Stephanodiscus sp.	100
	5. Pandorina sp.	100
	Other genera	214
	Total	1,756
11/06/74	1. Cryptomonas sp.	108
	2. Dactylococcopsis sp.	72
	3. Ankistrodesmus sp.	36
	4. Oocystis sp.	36
	5. Oscillatoria sp.	36
	Other genera	180
	Total	468

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
03/16/74	1	8.4
	2	9.0
	3	10.3
	4	8.3
05/23/74	1	111.5
	2	28.5
	3	42.1
	4	6.8
08/19/74	1	7.1
	2	6.5
	3	8.7
	4	12.8
11/06/74	1	1.5
	2	0.9
	3	0.5
	4	3.5

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.059	0.142	4.4
0.050 P	0.109	0.142	4.2
0.050 P + 1.0 N	0.109	1.142	21.1
1.0 N	0.059	1.142	14.5

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Lake Houston was high at the time the sample was taken (11/06/74). Also, the lack of increase in yield with the

addition of orthophosphorus alone indicates the lake was nitrogen limited at that time (note the marked increase in yield when only nitrogen was added).

The lake data indicate a spatial and temporal combination of limiting nutrients. Following is a tabulation of the mean inorganic nitrogen/orthophosphorus ratios for each of the sampling stations and times with the indicated limiting nutrient in parentheses.

Station	03/16/74	05/23/74	11/06/75
1	9/1 (N)	15/1 (P)	4/1 (N)
2	9/1 (N)	15/1 (P)	4/1 (N)
3	19/1 (P)	19/1 (P)	2/1 (N)
4	3/1 (N)	10/1 (N)	2/1 (N)

Note, however, that primary productivity in the lake may be light-limited rather than nutrient-limited much of the time. The mean of the Secchi disc depths for all sampling times was less than 0.4 meters; and in May, the level at which 1% of the incident light remained was less than 0.7 meters.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Texas National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page vi), except for the months of April and May when two samples were collected. Sampling was begun in September, 1974, and was completed in August, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Texas District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loads shown are those measured minus point-source loads, if any.

The outlet nutrient loads were calculated using the means of the nutrient concentrations at stations A-1, B-1, and C-1 and the mean outlet flow.

The nutrient loads estimated for the wastewater treatment plants impacting Cypress Creek were greater than the loads measured at station D-1. The background loads for Cypress Creek and the nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations at stations E-1, G-1, H-1, K-1, and L-1 and the mean annual Cypress Creek and ZZ flows.

None of the listed point sources participated in the Survey; nutrient loads from these sources were estimated at 1.134 kg P and 3.401 kg N/ capita/year, and populations were estimated on the basis of 0.3785 m^3/capita/day using the plant flows provided by Wyatt (1976).

A. Waste Sources:

1. Known municipal* -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Amer. Teachers Assoc.	320	?	181.7	Unnamed trib/ Spring Cr. embayment
Cleveland**	5,000	tr. filter	1,892.5	E. Fk., San Jacinto R.
Forest Cove MUD	3,330	?	1,892.5	Siefert Creek
Harris Co. UD #5	?	cont. aer.	?	no discharge
Houston - Hidden Echo STP	?	?	?	no discharge
Humble	1,711	tr. filter	647.6	Flood ditch/W. Fk., San Jacinto R.
New Caney Sch. Distr. -				
Jr. High Sch.	150	?	87.1	Trib/Caney Cr.
High Sch.	100	?	56.8	White Oak Cr./ Caney Cr.
Harris County WCID #119	7,000	?	2,649.5	Trib/Cypress Creek
Gulf Coast Waste Disp. Auth. (GCWDA):				
Ponderosa Central	17,000	?	6,434.5	Cypress Creek
Lake Forest	7,500	?	2,838.8	Cypress Creek
Bammel Central	10,000	?	3,785.0	Cypress Creek
Treschwig Central	8,650	?	3,274.0	Cypress Creek
Kleinwood Central	10,000	?	3,785.0	Cypress Creek
Spring - North Park	7,000	?	2,649.5	Cypress Creek

In addition, 29 smaller waste treatment facilities, serving an estimated population of 50,320, collectively discharge 19,046 m^3/day to Cypress Creek*.

* Wyatt, 1976.
** Boothe, 1974.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
W. Fk., San Jacinto R.	84,340	27.8
Cypress Creek	7,055	2.3
Spring Creek	31,970	10.5
Caney Creek	6,030	2.0
Peach Creek	3,855	1.3
E. Fk., San Jacinto R.	11,105	3.7
Luce Bayou	8,300	2.7
Unnamed Stream L-1	1,080	0.4
b. Minor tributaries & immediate drainage (non-point load) -	3,815	1.3
c. Known municipal STP's -		
Amer. Teachers Assoc.	365	0.1
Cleveland	5,670	1.9
Forest Cove MUD	3,775	1.3
Humble	1,940	0.6
New Caney Sch. Dist. -		
Jr. High	170	0.1
High School	115	<0.1
Harris County WCID #119	7,940	2.6
GCWDA:		
Ponderosa Central	19,280	6.3
Lake Forest	8,505	2.8
Bammel Central	11,340	3.7
Treschwig Central	9,810	3.2
Kleinwood Central	11,340	3.7
Spring - North Park	7,940	2.6
29 remaining plants	57,065	18.8
d. Septic tanks - Unknown	?	-
e. Known industrial - None	-	-
f. Direct precipitation* -	865	0.3
Total	303,670	100.0

2. Outputs -

Lake outlet - San Jacinto River and canals	171,455

3. Net annual P accumulation - 132,215 kg.

* See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (non-point load) -		
W. Fk., San Jacinto R.	667,300	30.3
Cypress Creek	105,075	4.8
Spring Creek	218,340	9.9
Caney Creek	116,230	5.3
Peach Creek	98,230	4.5
E. Fk., San Jacinto R.	247,970	11.2
Luce Bayou	189,625	8.6
Unnamed Stream L-1	15,905	0.7
b. Minor tributaries & immediate drainage (non-point load) -	56,820	2.6
c. Known municipal STP's -		
Amer. Teachers Assoc.	1,090	<0.1
Cleveland	17,005	0.8
Forest Cove MUD	11,325	0.5
Humble	5,820	0.3
New Caney Sch. Dist. -		
Jr. High	510	<0.1
High School	340	<0.1
Harris County WCID #119	23,805	1.1
GCWDA:		
Ponderosa Central	57,815	2.6
Lake Forest	25,510	1.2
Bammel Central	34,010	1.5
Treschwig Central	29,420	1.3
Kleinwood Central	34,010	1.5
Spring - North Park	23,805	1.1
29 remaining plants	171,140	7.8
d. Septic tanks - Unknown	?	-
e. Known industrial - None	-	-
f. Direct precipitation* -	53,475	2.4
Total	2,204,575	100.0

2. Outputs -

Lake outlet - San Jacinto River and canals 1,779,315

3. Net annual N accumulation - 425,260 kg.

* See Working Paper No. 175.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
W. Fk., San Jacinto R.	40	319
Spring Creek	30	206
Caney Creek	15	295
Peach Creek	10	243
E. Fk., San Jacinto R.	11	255
Luce Bayou	18	411
Unnamed Stream L-1	20	295

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	6.13	2.67	44.5	8.6

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Lake Houston:

"Dangerous" (eutrophic loading)	0.96
"Permissible" (oligotrophic loading)	0.48

V. LITERATURE REVIEWED

Anonymous, 1976. Water resources data for Texas, water year 1975. Water-Data Rept. TX-75-1, vol. 2, U.S. Geol. Surv., Austin.

Boothe, T. A. (City Mgr.), 1974. Treatment plant questionnaire. City of Cleveland.

Latchford, John B., Jr., 1974. Personal communication (lake morphometry). TX Water Qual. Bd., Austin.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

Wyatt, Linda B., 1976. Personal communication (point sources in the Lake Houston drainage). TX Water Qual. Bd., Austin.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	SOD- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P
4801	AMISTAD LAKE	0.013	0.500	371.474	2.042	14.400	0.009
4802	BASTROP LAKE	0.022	0.090	419.917	12.392	15.000	0.007
4803	BELTON RESERVOIR	0.016	0.1[illegible]	378.312	8.025	15.000	0.007
4804	BRAUNIG LAKE	0.134	0.150	461.625	22.762	14.800	0.062
4805	BROWNWOOD LAKE	0.027	0.100	470.375	4.887	14.400	0.007
4806	LAKE BUCHANAN	0.036	0.250	437.625	8.606	15.000	0.012
4807	CADDO LAKE	0.055	0.070	463.333	14.808	11.400	0.013
4808	CALAVERAS LAKE	0.038	0.060	461.667	22.500	13.000	0.007
4809	CANYON RESERVOIR	0.010	0.450	384.812	2.500	14.800	0.006
4810	LAKE COLORADO CITY	0.042	0.090	473.625	12.675	10.200	0.012
4811	CORPUS CRISTI LAKE	0.113	0.130	475.187	19.756	14.000	0.050
4812	DIVERSION LAKE	0.025	0.080	470.111	15.867	9.000	0.009
4813	EAGLE MOUNTAIN LAKE	0.024	0.070	469.625	5.662	11.000	0.008
4814	FT PHANTOM HILL LAKE	0.060	0.105	474.909	6.317	9.800	0.022
4815	GARZA LITTLE ELM RESERVO	0.045	0.380	475.782	14.156	14.600	0.018
4816	KEMP LAKE	0.023	0.110	455.000	10.217	10.400	0.007
4817	HOUSTON LAKE	0.097	0.260	486.187	16.650	12.400	0.036
4818	LAKE OF THE PINES	0.031	0.090	440.000	12.919	15.000	0.011
4819	LAVON RESERVOIR	0.063	0.180	485.333	5.400	8.800	0.018
4820	LIVINGSTON LAKE	0.196	0.555	465.469	16.112	15.000	0.128
4821	LYNDON B JOHNSON LAKE	0.042	0.420	456.500	8.100	14.900	0.013
4822	MEDINA LAKE	0.010	0.600	403.562	12.944	15.000	0.004
4823	LAKE MEREDITH	0.021	0.070	439.312	3.037	14.900	0.009
4824	PALESTINE LAKE	0.031	0.180	442.625	10.619	14.800	0.010
4825	POSSUM KINGDOM RESERVOIR	0.023	0.070	419.045	9.495	15.000	0.009
4826	SAN ANGELO RESERVOIR	0.098	0.140	481.000	24.675	10.200	0.011
4827	SAM RAYBURN RESERVOIR	0.029	0.150	439.458	6.267	15.000	0.009
4828	E V SPENCE RESERVOIR	0.036	0.080	462.583	11.775	15.000	0.008

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
4829	SOMERVILLE LAKE	0.053	0.115	473.833	24.491	13.000	0.013
4830	STAMFORD LAKE	0.073	0.060	482.714	13.457	10.600	0.012
4831	STILLHOUSE HOLLOW RESERV	0.018	0.150	406.250	3.917	15.000	0.010
4832	TAWAKONI LAKE	0.046	0.100	466.417	18.246	13.200	0.013
4833	TEXARKANA LAKE	0.106	0.120	478.500	19.119	12.400	0.030
4834	TEXOMA LAKE	0.042	0.160	451.321	12.493	15.000	0.018
4835	TRAVIS LAKE	0.018	0.250	389.913	5.595	15.000	0.007
4836	TRINIDAD	0.389	0.110	479.500	24.300	10.000	0.240
4837	TWIN BUTTES RESERVOIR	0.029	0.250	454.917	8.708	14.800	0.009
4838	WHITE RIVER RESERVOIR	0.020	0.110	434.500	4.333	15.000	0.009
4839	WHITNEY LAKE	0.028	0.120	430.500	6.912	15.000	0.008

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4801	AMISTAD LAKE	95 (36)	5 (2)	100 (38)	100 (38)	39 (14)	63 (21)	402
4802	BASTROP LAKE	79 (30)	74 (28)	82 (31)	47 (18)	17 (0)	92 (34)	343
4803	BELTON RESERVOIR	92 (35)	26 (10)	97 (37)	68 (26)	17 (0)	84 (31)	384
4804	BRAUNIG LAKE	5 (2)	42 (16)	50 (19)	8 (3)	49 (17)	5 (2)	159
4805	BROWNWOOD LAKE	66 (25)	70 (26)	29 (11)	87 (33)	58 (22)	84 (31)	394
4806	LAKE BUCHANAN	47 (18)	21 (7)	74 (28)	63 (24)	17 (0)	39 (14)	261
4807	CADDO LAKE	26 (10)	91 (33)	42 (16)	32 (12)	76 (29)	30 (10)	297
4808	CALAVERAS LAKE	45 (17)	100 (38)	47 (18)	11 (4)	67 (25)	92 (34)	362
4809	CANYON RESERVOIR	99 (37)	8 (3)	95 (36)	97 (37)	49 (17)	97 (37)	445
4810	LAKE COLORADO CITY	39 (14)	76 (28)	26 (10)	42 (16)	88 (33)	39 (14)	310
4811	CORPUS CRISTI LAKE	8 (3)	47 (18)	18 (7)	13 (5)	61 (23)	8 (3)	155
4812	DIVERSION LAKE	68 (26)	83 (31)	32 (12)	29 (11)	97 (37)	63 (21)	372
4813	EAGLE MOUNTAIN LAKE	71 (27)	91 (33)	34 (13)	79 (30)	79 (30)	76 (28)	430
4814	FT PHANTOM HILL LAKE	24 (9)	66 (25)	21 (8)	74 (28)	95 (36)	16 (6)	296
4815	GARZA LITTLE ELM RESERVO	34 (13)	13 (5)	16 (6)	34 (13)	55 (21)	21 (7)	173
4816	KEMP LAKE	76 (29)	61 (22)	55 (21)	55 (21)	84 (32)	92 (34)	423
4817	HOUSTON LAKE	16 (6)	16 (6)	0 (0)	24 (9)	72 (27)	11 (4)	139
4818	LAKE OF THE PINES	54 (20)	76 (28)	66 (25)	39 (15)	17 (0)	46 (17)	298
4819	LAVON RESERVOIR	21 (8)	29 (11)	3 (1)	84 (32)	100 (38)	21 (7)	258
4820	LIVINGSTON LAKE	3 (1)	3 (1)	39 (15)	26 (10)	17 (0)	3 (1)	91
4821	LYNDON B JOHNSON LAKE	39 (14)	11 (4)	53 (20)	66 (25)	39 (14)	30 (10)	238
4822	MEDINA LAKE	99 (37)	0 (0)	89 (34)	37 (14)	17 (0)	100 (38)	342
4823	LAKE MEREDITH	82 (31)	91 (33)	71 (27)	95 (36)	39 (14)	63 (21)	441
4824	PALESTINE LAKE	54 (20)	32 (12)	63 (24)	53 (20)	49 (17)	51 (19)	302
4825	POSSUM KINGDOM RESERVOIR	74 (28)	91 (33)	84 (32)	58 (22)	17 (0)	63 (21)	387
4826	SAN ANGELO RESERVOIR	13 (5)	45 (17)	8 (3)	0 (0)	88 (33)	46 (17)	200
4827	SAM RAYBURN RESERVOIR	59 (22)	39 (15)	68 (26)	76 (29)	17 (0)	63 (21)	322
4828	E V SPENCE RESERVOIR	50 (19)	83 (31)	45 (17)	50 (19)	17 (0)	76 (28)	321

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4829	SOMERVILLE LAKE	29 (11)	55 (21)	24 (9)	3 (1)	67 (25)	30 (10)	204
4830	STAMFORD LAKE	18 (7)	97 37)	5 (2)	18 (7)	82 (31)	39 (14)	259
4831	STILLHOUSE HOLLOW RESERV	88 (33)	37 (14)	87 (33)	92 (35)	17 (0)	51 (14)	372
4832	TAWAKONI LAKE	32 (12)	70 (26)	37 (14)	21 (8)	63 (24)	30 (10)	253
4833	TEXARKANA LAKE	11 (4)	51 (19)	13 (5)	16 (6)	72 (27)	13 (5)	176
4834	TEXOMA LAKE	39 (14)	34 (13)	61 (23)	45 (17)	17 (0)	21 (7)	217
4835	TRAVIS LAKE	88 (33)	21 (7)	92 (35)	82 (31)	17 (0)	84 (31)	384
4836	TRINIDAD	0 (0)	61 (22)	11 (4)	5 (2)	92 (35)	0 (0)	169
4837	TWIN BUTTES RESERVOIR	59 (22)	21 (7)	58 (22)	61 (23)	49 (17)	63 (21)	311
4838	WHITE RIVER RESERVOIR	84 (32)	61 (22)	76 (29)	89 (34)	17 (0)	63 (21)	390
4839	WHITNEY LAKE	63 (24)	51 (19)	79 (30)	71 (27)	17 (0)	76 (28)	357

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	4809	CANYON RESERVOIR	445
2	4823	LAKE MEREDITH	441
3	4813	EAGLE MOUNTAIN LAKE	430
4	4816	KEMP LAKE	423
5	4801	AMISTAD LAKE	402
6	4805	BROWNWOOD LAKE	394
7	4802	BASTROP LAKE	393
8	4838	WHITE RIVER RESERVOIR	390
9	4825	POSSUM KINGDOM RESERVOIR	387
10	4835	TRAVIS LAKE	384
11	4803	BELTON RESERVOIR	384
12	4831	STILLHOUSE HOLLOW RESERV	372
13	4812	DIVERSION LAKE	372
14	4808	CALAVERAS LAKE	362
15	4839	WHITNEY LAKE	357
16	4822	MEDINA LAKE	342
17	4827	SAM RAYBURN RESERVOIR	322
18	4828	E V SPENCE RESERVOIR	321
19	4837	TWIN BUTTES RESERVOIR	311
20	4810	LAKE COLORADO CITY	310
21	4824	PALESTINE LAKE	302
22	4818	LAKE OF THE PINES	298
23	4807	CADDO LAKE	297
24	4814	FT PHANTOM HILL LAKE	296
25	4806	LAKE BUCHANAN	261
26	4830	STAMFORD LAKE	259
27	4819	LAVON RESERVOIR	258
28	4832	TAWAKONI LAKE	253

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
29	4821	LYNDON B JOHNSON LAKE	238
30	4834	TEXOMA LAKE	217
31	4829	SOMERVILLE LAKE	208
32	4826	SAN ANGELO RESERVOIR	200
33	4833	TEXARKANA LAKE	176
34	4815	GARZA LITTLE ELM RESERVO	173
35	4836	TRINIDAD	169
36	4804	BRAUNIG LAKE	159
37	4811	CORPUS CRISTI LAKE	155
38	4817	HOUSTON LAKE	139
39	4820	LIVINGSTON LAKE	91

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR TEXAS 04/10/76

LAKE CODE 4817 HOUSTON LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 7324.5

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4817A1	7324.5	53.52	66.54	37.10	61.73	55.22	46.72	11.58	4.67	12.32	20.93	44.74	35.40	37.26
4817B1	0.0	0.68	0.68	0.74	0.76	0.82	0.88	0.88	0.85	0.76	0.71	0.68	0.68	0.76
4817D1	782.2	5.52	6.37	2.27	5.52	7.79	5.95	2.27	1.42	2.83	3.40	4.25	3.82	4.26
4817E1	1059.3	7.39	8.58	4.90	9.06	8.92	6.99	2.52	1.87	2.46	2.46	6.77	5.30	5.57
4817G1	393.7	3.68	4.53	2.97	4.25	3.40	3.54	1.42	0.85	1.27	1.84	2.69	2.55	2.73
4817H1	404.0	3.54	5.10	2.97	3.40	3.26	2.83	1.42	0.85	1.27	2.27	2.41	2.12	2.60
4817J1	971.2	9.20	11.19	7.36	11.75	8.92	8.21	2.41	1.13	2.27	3.26	9.63	7.08	6.82
4817K1	461.0	4.11	5.15	3.00	4.59	4.33	3.77	1.39	0.99	1.44	2.04	3.37	2.83	3.06
4817L1	53.9	0.48	0.59	0.34	0.54	0.51	0.45	0.17	0.11	0.17	0.23	0.40	0.34	0.36
4817ZZ	3198.6	26.65	25.80	19.09	30.02	28.32	24.69	9.51	5.80	9.37	13.00	22.06	18.55	19.33

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 7324.5
SUM OF SUB-DRAINAGE AREAS = 7324.0

TOTAL FLOW IN = 548.75
TOTAL FLOW OUT = 450.46

NOTE *** NO DRAINAGE AREA FOR 4817B1

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4817A1	9	74	110.436	8	0.0				
	10	74	53.802	7	52.386				
	11	74	249.188	4	396.436				
	12	74	110.436	9	178.396				
	1	75	87.782	24	189.440				
	2	75	99.109	19	79.287				
	3	75	42.475	22	164.238				
	4	75	189.723	18	441.743	30	67.960		
	5	75	130.257	13	356.792	29	147.814		
	6	75	59.465	13	294.495				
	7	75	28.317	27	59.465				
	8	75	26.901	26	36.812				
4817B1	9	74	1.218	8	2.010				
	10	74	1.444	7	2.180				
	11	74	1.019	4	1.076				
	12	74	1.019	9	1.019				
	1	75	0.680	24	0.453				
	2	75	1.274	19	0.453				
	3	75	1.671	22	2.152				
	4	75	1.812	18	1.869	30	0.963		
	5	75	2.067	13	2.209	29	2.180		
	6	75	1.642	13	0.566				
	7	75	1.671	27	1.274				
	8	75	0.595	26	0.510				

TRIBUTARY FLOW INFORMATION FOR TEXAS 06/10/76

LAKE CODE 4817 HOUSTON LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
481701	9	74	20.841	7	0.278				
	10	74	2.095	7	0.906				
	11	74	21.549	7	9.798				
	12	74	14.045						
	1	75	4.163	7	3.653				
	2	75	9.061						
	3	75	3.087	10	0.170				
	4	75	25.457	2	0.850	19	15.914		
	5	75	9.968	5	2.803	13	7.362		
	6	75	8.948	12	37.095				
	7	75	3.115	3	7.759				
	8	75	2.067	19	1.019				
4817E1	9	74	13.196	7	0.368				
	10	74	2.152	7	0.850				
	11	74	23.928	7	7.023				
	12	74	13.932	9	8.523				
	1	75	7.674	7	4.870				
	2	75	13.535						
	3	75	5.097	10	1.841				
	4	75	34.547	2	1.756	19	10.081		
	5	75	10.619	5	2.973	21	1.784		
	6	75	6.145	12	20.501				
	7	75	4.276	3	19.086				
	8	75	3.171	19	0.878				
4817G1	9	74	8.778	8	0.736				
	10	74	9.345	7	0.991				
	11	74	26.759	8	77.871				
	12	74	8.353	11	17.471				
	1	75	8.495	12	5.663				
	2	75	7.787	2	14.498				
	3	75	3.794	10	1.812				
	4	75	14.838	12	7.844				
	5	75	11.327	26	9.571				
	6	75	4.870						
	7	75	2.917	2	9.911	20	2.803		
	8	75	1.614	24	1.642				
4817H1	9	74	4.248	8	0.765				
	10	74	2.632	7	0.906				
	11	74	15.772	7	6.315				
	12	74	12.459	11	15.772				
	1	75	7.787	12	8.778				
	2	75	7.447	2	12.459				
	3	75	4.899	10	2.209				
	4	75	11.525	12	19.510				
	5	75	8.184	26	9.939				
	6	75	4.616						
	7	75	3.483	20	2.124				
	8	75	3.398	28	2.010				

TRIBUTARY FLOW INFORMATION FOR TEXAS 06/10/76

LAKE CODE 4817 HOUSTON LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4817J1	9	74	19.652	8	1.982				
	10	74	16.735	8	1.642				
	11	74	54.652	4	8.778				
	12	74	18.236	9	5.663				
	1	75	22.880	13	20.218				
	2	75	19.142	3	28.883				
	3	75	9.061	11	4.078				
	4	75	22.653	3	4.587	25	5.380		
	5	75	31.432						
	6	75	9.061	11	36.246				
	7	75	5.663	22	3.483				
	8	75	5.182	22	3.964	24	2.973		
4817K1	9	74	2.039	8	0.283				
	10	74	1.416	8	0.368				
	11	74	7.532	4	4.729				
	12	74	5.890	9	2.888				
	1	75	3.710	13	3.115				
	2	75	3.540	3	6.173				
	3	75	2.379	11	1.161				
	4	75	5.493	3	1.274	25	1.586		
	5	75	3.908						
	6	75	2.265	11	11.355				
	7	75	1.699	22	0.708				
	8	75	1.642	22	1.076				
4817L1	9	74	0.079	8	0.0				
	10	74	0.008	6	0.0				
	11	74	0.108	4	0.0				
	12	74	0.054	9	0.0				
	1	75	0.054	13	0.023				
	2	75	0.054	3	0.153				
	3	75	0.303	11	0.003				
	4	75	0.051	3	0.006	25	0.008		
	5	75	0.045						
	6	75	0.031	11	0.181				
	7	75	0.011	22	0.006				
	8	75	0.023	22	0.003				
4817ZZ	9	74	62.297						
	10	74	23.220						
	11	74	107.604						
	12	74	45.307						
	1	75	39.644						
	2	75	48.139						
	3	75	19.539						
	4	75	82.119						
	5	75	67.960						
	6	75	28.317						
	7	75	15.857						
	8	75	11.610						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/..

481701
29 55 04.0 095 08 35.0
HOUSTON LAKE
48201 TEXAS

11EPALES
3

2111202
0010 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
74/03/16	10	0000	19..		18	149	7.80	44	0.090	0.700	0.200	0.036
	10	0006	19..	8.0		149	7.70	43	0.070	0.600	0.190	0.026
74/05/23	14	0000	27..		12	220	7.40	37	0.110	0.700	0.300	0.027
	14	0002	27..	6.8		220						
	14	0006	27..	6.0		217	7.15	37	0.130	0.500	0.410	0.036
74/08/19	13	0000	28..	5.2	12	244	7.70					
	13	0008	28..	5.0		243	7.50					
74/11/06	10	0000	22..	6.2	11	2598	7.07	29	0.090	0.900	0.090	0.043
	10	0005	21..	6.2		3889	6.86	27	0.080	0.800	0.090	0.045
	10	0010	22..			3873	6.84					

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/16	10	0000	0.05..	8.4	
	10	0006	0.03..		
74/05/23	14	0000	0.1..	111.5	
	14	0002			1.0
	14	0006	0.1..		
74/08/19	13	0000		7.1	
74/11/06	10	0000	0.1..	1.5	
	10	0005	0.1..		

33

STORET RETRIEVAL DATE 76/02/11

481702
29 59 18.0 095 07 35.0
HOUSTON LAKE
48201 TEXAS

11EPALES
3

2111202
0020 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
74/03/16	10 45	0000	20.4		18	199	7.50	48	0.100	0.800	0.120	0.025
	10 45	0006	20.3	7.0		195	7.50	47	0.090	0.600	0.110	0.023
	10 45	0016	20.4	7.0		199	7.40	47	0.090	0.600	0.110	0.023
74/05/23	14 45	0000	27.2		12	214	6.85	36	0.130	0.800	0.420	0.039
	14 45	0005	26.9	5.6		214	6.80	36	0.140	0.600	0.460	0.040
	14 45	0010	26.9	3.8		214	6.80	27	0.110	0.600	0.380	0.036
	14 45	0015	26.8	6.0		214	6.80	29	0.130	0.600	0.420	0.036
74/08/19	14 05	0000	31.9	5.8	11	269	7.65					
	14 05	0015	29.7	5.4		260	7.55					
74/11/06	11 05	0000	22.6	7.2	17	2895	6.46	21	0.080	0.800	0.060	0.035
	11 05	0005	22.7	5.6		2448	6.44	24	0.080	0.700	0.060	0.033
	11 05	0010	22.6	5.6		2258	6.52	24	0.060	0.700	0.060	0.046

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/16	10 45	0000	0.067	9.0	
	10 45	0006	0.059		
	10 45	0016	0.059		
74/05/23	14 45	0000	0.124	28.5	
	14 45	0002			1.0
	14 45	0005	0.115		
	14 45	0010	0.116		
	14 45	0015	0.121		
74/08/19	14 05	0000		6.5	
74/11/06	11 05	0000	0.100	0.9	
	11 05	0005	0.097		
	11 05	0010	0.093		

STORET RETRIEVAL DATE 76/02/11

481703
30 02 22.0 095 07 24.0
HOUSTON LAKE
48201 TEXAS

11EPALES
3

2111202
0017 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
74/03/16	11	15 0000	20.5		18	188	7.20	37	0.100	0.700	0.160	0.017
	11	15 0006	20.4	7.0		193	7.15	38	0.090	0.600	0.160	0.012
	11	15 0013	20.5	6.6		191	7.15	39	0.110	0.600	0.160	0.012
74/05/23	15	10 0000	28.4		12	178	7.00	20	0.130	0.900	0.260	0.022
	15	10 0005	27.2	4.6		176	6.70	19	0.140	0.700	0.270	0.020
	15	10 0013	26.7	4.0		194	6.50	23	0.140	0.700	0.340	0.027
74/08/19	14	25 0000	31.2	4.6	12	227	7.60					
	14	25 0015	30.1	2.6		223	7.20					
74/11/06	11	30 0000	22.0	5.0	15	1424	6.26	18	0.060	1.100	0.030	0.041
	11	30 0005	22.0	5.0		1211	6.17	18	0.050	1.000	0.020	0.039
	11	30 0010	22.0	6.0		1380	6.23	18	0.070	1.000	0.020K	0.041

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/16	11	15 0000	0.054	10.3	
	11	15 0006	0.051		
	11	15 0013	0.050		
74/05/23	15	10 0000	0.084	42.1	
	15	10 0002			1.0
	15	10 0005	0.087		
	15	10 0013	0.126		
74/08/19	14	25 0000		8.7	
	14	25 0002			5.0
	14	25 0003			1.0
74/11/06	11	30 0000	0.090	0.5	
	11	30 0005	0.083		
	11	30 0010	0.082		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/11

481704
30 02 17.0 095 09 25.0
HOUSTON LAKE
48201 TEXAS

11EPALES
3

2111202
0006 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
74/03/16	11 40	0000	20.2	7.6	18	350	7.55	68	0.070	1.000	0.050	0.045
74/05/23	15 30	0000	28.3		12	237	7.75	28	0.100	1.000	0.300	0.043
	15 30	0002	28.3	5.8		237						
	15 30	0007	27.3	4.0		241	7.00	31	0.220	0.900	0.270	0.047
74/08/19	14 55	0000	31.7	4.8	9	314	7.65					
74/11/06	11 55	0000	20.7	6.2	14	154	6.85	56	0.100	1.300	0.120	0.099
	11 55	0005	20.2			156	6.82					

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/16	11 40	0000	0.105	8.3	
74/05/23	15 30	0000	0.176	6.8	
	15 30	0002			1.0
	15 30	0007	0.141		
74/08/19	14 55	0000		12.8	
74/11/06	11 55	0000	0.183	3.5	

APPENDIX E

TRIBUTARY DATA

STORET RETRIEVAL DATE 76/03/10

481741
29 52 35.0 095 05 40.0 4
SAN JACINTO RIVER
48023 7.5 CROSBY
O/HOUSTON LAKE
HWY 90 BRDG 1.2 MI NE OF SHELDON
11EPALES 21112U4
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/04	09 15		0.124	1.300	0.020	0.430	0.525
74/10/07	09 15		0.176	1.000	0.135	0.075	0.120
74/11/04	09 30		0.144	0.800	0.130	0.060	0.130
74/12/09	09 30		0.088	1.300	0.048	0.056	0.110
75/01/24	09 00		0.136	1.200	0.052	0.040	0.090
75/02/19	09 30		0.112	2.200	0.064	0.048	0.110
75/03/22	09 00		0.175	2.000	0.230	0.060	0.120
75/04/18	09 15		0.145	1.400	0.070	0.050	0.100
75/04/30	09 00		0.190	1.050	0.150	0.050	0.120
75/05/13	09 45		0.330	1.400	0.045	0.075	0.130
75/05/29	08 55		0.220	0.850	0.040	0.055	0.120
75/06/13	11 45		0.170	0.750	0.045	0.045	0.110
75/07/27	09 10		0.925	0.900	0.035	0.020	0.100
75/08/26	10 40		0.110	0.650	0.017	0.063	0.120

STORET RETRIEVAL DATE 76/03/10

481781
29 55 25.0 095 04 20.0 4
SAN JACINTO RIVER CANAL
48 7.5 CROSBY
O/HOUSTON LAKE
2NDRY RD 2100 BRDG 1 MI N OF CROSBY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	10 15		0.252	1.900	0.040	0.090	0.165
74/10/07	10 00		0.224	0.800	0.030	0.075	0.110
74/11/04	09 45		0.208	1.100	0.055	0.070	0.130
74/12/09	10 10		0.104	0.900	0.208	0.048	0.110
75/01/24	09 30		0.224	1.500	0.056	0.080	0.180
75/02/19	09 45		0.016	1.800	0.010	0.040	0.130
75/03/22	09 15		0.620	4.200	0.125	0.030	
75/04/18	09 30		0.015	1.550	0.065	0.025	0.290
75/04/30	09 10		0.030	1.250	0.110	0.040	0.160
75/05/13	10 00		0.550		0.015	0.050	0.100
75/05/29	09 05		0.080	1.150	0.075	0.025	0.110
75/06/13	11 58		0.015	2.400	0.075	0.125	0.320
75/08/26	10 55		0.315	1.450	0.080	0.025	0.200

STORET RETRIEVAL DATE 76/03/10

4817C1
29 54 05.0 095 09 12.0 4
#EST CANAL
48 7.5 HABMASTON
T/HOUSTON LAKE
BRDG AT S EDGE ALEXANDER DEUSSEN PARK
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	12 00		0.250	1.200	0.035	0.065	0.170
74/10/07	12 00		0.200	0.900	0.045	0.014	0.090
74/11/08	11 00		0.104	1.200	0.250	0.050	0.110
74/12/11	13 00		0.104	1.450	0.292	0.052	0.105
75/01/12	12 45		0.128	1.000	0.048	0.040	0.190
75/02/02	12 00		0.152	1.000	0.048	0.048	0.070
75/03/10	11 30		0.150	1.600	0.055	0.055	0.140
75/04/12	11 30		0.190	0.450	0.130	0.015	0.050
75/05/26	12 30		0.195	0.900	0.065	0.050	0.120
75/07/20	11 30		0.220	0.750	0.060	0.050	0.110
	13 30		0.185	0.650	0.040	0.050	0.120

STORET RETRIEVAL DATE 76/03/10

481701
30 02 00.0 095 22 03.0 4
CYPRESS CREEK
48 7.5 MAEDAN
T/HOUSTON LAKE
TREUSCHWIG RD BRDG 3 MI NE OF WESTFIELD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/07	16	00	1.920	2.100	0.230	1.880	1.880
74/10/07	12	17	2.000	1.100	0.175	1.570	1.570
74/11/07	12	25	0.336	2.400	0.200	0.380	0.780
75/01/07	13	15	0.384	2.100	0.170	0.415	0.630
75/03/10	09	30	2.630	2.900	0.900	2.700	3.200
75/04/02	09	05	1.050	2.350	0.600	0.660	1.900
75/04/19	18	05	0.190	1.900	0.135	0.200	0.400
75/05/05	09	10	0.590	3.100	1.000	0.575	0.720
75/05/13	08	00	2.300	1.700	0.115	1.950	2.110
75/06/12	08	40	0.115	1.600	0.195	0.165	0.310
75/07/03	08	16	0.300	1.400	0.085	0.210	0.350
75/08/19	09	15	0.220	0.250	0.015	0.165	0.210

14

STORET RETRIEVAL DATE 75/03/10

4817E1
30 36 30.0 095 26 15.0 4
SPRING CREEK
48 HARRIS CO MAP
T/HOUSTON LAKE
HWY 45 BRDG 2.4 MI NW OF SPRING
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/07	15 30		0.540	1.000	0.125	0.200	0.320
74/10/07	11 50		0.576	0.500	0.095	0.125	0.220
74/11/07	12 00		0.160	1.200	0.185	0.115	0.270
75/01/07	12 45		0.096	1.300	0.232	0.064	0.150
75/03/10	09 10		0.210	0.950	0.220	0.100	0.150
75/04/02	08 40		0.290	1.000	0.150	0.120	0.170
75/04/19	18 35		0.170	1.250	0.115	0.085	0.160
75/05/05	08 40		0.290	1.000	0.170	0.130	0.170
75/05/21	09 05		0.290	1.000	0.125	0.110	0.180
75/06/12	09 20		0.095	1.200	0.070	0.025	0.080
75/07/03	07 45		0.135	1.000	0.060	0.050	0.110
75/08/19	08 20		0.270	0.400	0.030	0.165	0.210

74

STORET RETRIEVAL DATE 76/03/10

4817F1
30 04 55.0 095 17 45.0 4
W FORK SAN JACINTO RIV
48 7.5 MAEDAN
T/HOUSTON LAKE
BANK SAMP 2NDRY RD 3 MI SW JCT RD 1314
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/07	16	45	0.264	0.700	0.105	0.145	0.250
74/10/07	12	51	0.188	0.500	0.020	0.038	0.070
75/01/07	13	45	0.168	0.800	0.064	0.050	0.130
75/03/10	10	25	0.280	1.050	0.085	0.095	0.170
75/04/02	10	05	0.320	0.850	0.100	0.060	0.120
75/04/19	17	30	0.170	1.000	0.055	0.045	0.080
75/05/05	09	55	0.290	1.250	0.185	0.125	0.190
75/05/21	07	55	0.195	2.000	0.400	0.050	0.110
75/06/12	08	00	0.055	0.850		0.025	0.090
75/07/02	16	00	0.410	0.750	0.105		0.180
75/08/19	09	40	0.290	0.500	0.010	0.165	0.250

STORET RETRIEVAL DATE 75/03/10

481761
30 06 55.0 095 11 30.0 4
CANEY CREEK
48 7.5 SPLENDORA
T/HOUSTON LAKE
2NDRY RD BRDG 1.3 MI E JCT W HWY 59
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	15	00	0.192	0.700	0.230	0.016	0.035
74/10/07	11	15	0.152	0.900	0.030	0.015	0.015
74/11/08	10	15	0.096	1.700	0.360	0.032	0.080
74/12/11	12	10	0.072	2.200	0.552	0.088	0.090
75/01/12	11	00	0.088	1.700	0.080	0.024	0.110
75/02/02	10	50	0.104	2.100	0.072	0.024	0.070
75/03/10	10	10	0.165	0.700	0.030	0.015	0.020
75/04/12	10	00	0.055	1.250	0.065	0.020	0.080
			0.300	0.550	0.110	0.025	0.080
75/05/26	10	00	0.220	2.500	0.525	0.025	0.180
75/07/02	10	00	0.190	0.400	0.020	0.005	0.030
75/07/20	10	55	0.200	0.450	0.040	0.015	0.060
75/08/24	11	00	0.095	0.550	0.045	0.045	0.090

STORET RETRIEVAL DATE 76/03/10

481741
30 08 47.0 095 10 15.0 4
PEACH CREEK
48 7.5 SPLENDORA
T/HOUSTON LAKE
2NDRY RD 1485 BRDG 2.6 MI E JCT W HWY 59
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	15 20		0.176	0.500	0.075	0.030	0.050
74/10/07	11 05		0.152	0.900	0.025	0.015	0.020
74/11/07	10 00		0.096	1.600	0.240	0.020	0.100
74/12/11	12 00		0.048	1.600	0.400	0.032	0.070
75/01/12	10 50		0.064	1.000	0.040	0.016	0.050
75/02/02	10 35		0.780	1.300	0.072	0.025	0.050
75/03/10	10 30		0.130	1.300	0.610	0.020	0.040
75/04/12	09 45		0.045	0.850	0.070	0.015	0.050
	09 46		0.165	0.550	0.135	0.015	0.040
75/05/26	13 00		0.130	2.600	0.390	0.025	
75/07/20	09 45		0.210	0.300	0.060	0.010	0.030
	10 35		0.175	0.350	0.045	0.010	0.030
75/08/28	12 30		0.180	0.350	0.030	0.025	0.040

45

STORET RETRIEVAL DATE 76/03/10

4817J1
30 07 45.0 095 07 15.0 4
E FK SAN JACINTO RIVER
48 MONTGOMERY CO
T/HOUSTON LAKE
2NDRY RD 1485 BRDG 6 MI E JCT W HWY 59
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	09 30		0.168	2.000	0.130	0.060	0.110
74/10/08	11 46		0.296	0.500	0.040	0.075	0.090
74/11/04	13 55		0.032	1.400	0.125	0.035	0.080
74/12/09	11 20		0.048	1.600	0.232	0.032	0.080
75/01/13	15 00		0.104	1.300	0.104	0.024	0.170
75/02/03	13 30		0.056	1.400	0.144	0.032	0.080
75/03/11	13 30		0.135	0.950	0.290	0.035	0.070
75/04/03	14 30		0.200	1.300	0.195	0.010	0.020
75/04/25	12 00		0.220	0.875	0.190	0.035	0.080
75/06/11	12 00		0.500	0.800	0.025	0.005	0.020
75/07/22	12 30		0.210	0.600	0.035	0.045	0.090
75/08/22	11 00		0.115	0.600	0.150	0.035	0.080
75/08/24	12 45		0.155	0.450	0.015	0.015	0.050

96

STORET RETRIEVAL DATE 76/03/10

4817K1
30 06 35.0 095 03 30.0 4
LUCE BAYOU
48 7.5 HUFFMAN
T/HOUSTON LAKE
AT PIPELINE XING 6.5 MI NW OF EASTGATE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	10	20	0.136	1.700	0.115	0.065	0.110
74/10/08	13	24	0.096	0.700	0.040	0.055	0.070
74/11/04	15	10	0.024	2.000	0.270	0.025	0.060
74/12/09	12	20	0.024	1.300	0.336	0.032	0.070
75/01/13	15	30	0.040	2.000		0.024	0.082
75/02/03	14	00	0.040	2.700	0.336	0.032	0.070
75/03/11	14	00	0.040	2.800	0.330	0.035	0.090
75/04/03	13	00	0.065	2.800	0.570	0.025	0.040
75/04/25	12	30	0.070	2.500	0.400	0.040	0.120
75/06/11	10	15	0.005	1.600		0.040	0.160
75/07/22	13	00	0.010	1.100		0.020	0.070
75/08/22	11	30	0.035	1.800	0.115	0.020	0.090

47

STORET RETRIEVAL DATE 75/03/10

481711
30 01 05.0 095 06 55.0 4
UNNAMED STREAM
48 7.5 HUFFMAN
T/HOUSTON LAKE
2NDRY RD 1960 BRDG 2 MI SW HUFFMAN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
75/01/13	16 00		0.056	1.200	0.192	0.056	0.110
75/02/03	13 00		0.040	1.500	0.144	0.040	0.120
75/03/11	13 00		0.030	1.350	0.075	0.025	0.050
75/04/03	13 30		0.040	0.450	0.055	0.010	0.030
75/04/25	13 00		0.040	0.900	0.200	0.045	0.080
75/06/11	09 00		0.025	2.200	0.060	0.010	0.120
75/07/22	12 00		0.005	1.350	0.380	0.045	0.130
75/08/22	10 40		0.020	2.000	0.345	0.020	0.120

48

STORET RETRIEVAL DATE 76/03/10

4817M1
29 59 30.0 095 07 12.0 4
UNNAMED DITCH
48 7.5 CROSBY
O/HOUSTON LAKE
CASCADIA RD BRDG 1.8 MI W OF CROSBY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	11	15	0.032	2.000	0.100	0.040	0.175
74/10/07	10	30	0.048	0.600	0.035	0.020	0.060
74/11/09	10	15	0.016	0.600	0.030	0.015	0.060
74/12/09	10	20	0.024	1.100	0.128	0.016	0.050
75/01/24	09	45	0.056	4.400	0.552	0.160	0.500
75/02/19	10	00	0.024	2.100	0.048	0.016	0.080
75/03/22	09	30	0.025	1.400	0.040	0.015	0.060
75/04/18	09	50	0.060	1.350	0.230	0.020	0.040
75/04/30	09	30	0.025	0.900	0.070	0.010	0.050
75/05/13	10	15	0.240	1.600	0.060	0.095	0.225
75/05/29	09	15	0.200	0.900	0.080	0.070	0.170
75/06/13	12	10	0.015	1.650	0.070	0.085	0.260
75/07/27	09	25	0.135	0.600	0.020	0.015	0.040
75/08/26	11	15	0.010	0.550	0.010	0.010	0.040

64

STORET RETRIEVAL DATE 76/03/10

4817N1
30 30 54.0 095 04 25.0 4
LITTLE CREEK
48 7.5 CAMILLA
T/HOUSTON LAKE
2NDRY RD XING 0.7 MI SW JCT W HWY 150
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/08	11 00		0.036	0.100K	0.030	0.005	0.005
74/10/07	10 15		0.040	0.300	0.020	0.005	0.010K
74/11/09	11 10		0.024	0.500	0.135	0.010	0.010
74/12/07	10 30		0.056	0.300	0.024	0.005	0.010K
75/01/12	10 45		0.024	0.400	0.032	0.008K	0.010
75/02/08	10 10		0.008	0.300	0.040	0.008	0.010K
75/03/08	10 45		0.007	0.300	0.020	0.005K	0.010
75/04/05	10 50		0.015	0.250	0.055	0.005K	0.010K
75/04/26	15 45		0.025	0.200	0.050	0.005K	0.020
75/05/10	10 00		0.030	0.550	0.070	0.005	0.010K
75/05/24	10 30		0.030	0.350	0.040	0.010	0.010
75/06/13	11 35		0.025	0.400	0.075	0.005	0.010K
75/07/12	10 10		0.060	0.300	0.050	0.005K	0.040
75/08/09	13 30		0.050	0.250	0.020	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

4817P1
30 29 35.0 095 06 22.0 4
TARKINTON BAYOU
48 SAN JACINTO CO
T/HOUSTON LAKE
2NDRY RD XING 3.5 MI SW JCT W HWY 150
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/07	10 30		0.032	1.100	0.085	0.030	0.040
74/11/09	11 30		0.008	0.800	0.030	0.010	0.030
74/12/07	10 50		0.016	0.900	0.056	0.024	0.030
75/01/12	10 55		0.024	0.500	0.064	0.008K	0.010
75/02/08	11 00		0.008	0.400	0.024	0.008K	0.010K
75/03/08	11 00		0.005	0.500	0.030	0.010	0.030
75/04/05	11 05		0.010	0.550	0.075	0.005	0.020
75/04/26	16 00		0.020	0.450	0.085	0.005	0.040
75/05/10	10 20		0.030	1.250	0.135	0.010	0.010
75/05/24	10 45		0.030	1.100	0.084	0.005K	0.030
75/06/14	11 15		0.035	0.350	0.070	0.005	0.010
75/07/12	10 20		0.065	0.500	0.090	0.005K	0.050
75/08/09	13 50		0.050	0.600	0.060	0.005K	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

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